

Sum 51

1. An electrically conductive composition which comprises:
 2. a plurality of polymeric complexes; each polymeric complex comprising:
 3. a strand of a π -conjugated polymer; and
 4. a strand of a polyelectrolyte, the polyelectrolyte being non-covalently bonded to
 5. the π -conjugated polymer and having at least one reactive functional group, the reactive
 6. functional group facilitating the cross-linkage between the polymeric complexes when
 7. the complexes are heated.
1. 2. The composition of claim 1 wherein the π -conjugated polymer is selected from
2. the group consisting of polyaniline, polypyrrole, polyacetylene and polythiophene.
1. 3. The composition of claim 2 wherein the polyelectrolyte is selected from the group
2. consisting of poly(butadiene-co-maleic acid), poly(vinylmethylether-co-maleic acid),
3. poly(acrylic acid), poly(ethylmethacrylate-co-acrylic acid) and poly(acrylamide-co-
4. acrylic acid).
1. 4. The composition of 3 wherein the polyelectrolyte has a backbone and the
2. functional group comprises:
 3. at least one unsaturated double bond in the polymer backbone of the
 4. polyelectrolyte.
1. 5. The composition of claim 4 wherein the functional group comprises at least one
2. pendent group selected from the group consisting of carboxylic acid groups, hydroxy
3. groups, amine groups, amide groups, nitrile groups, aldehyde groups and ketone groups.

1 6. The composition of claim 5 wherein there are at least two functional groups and
2 each functional group reacts with each other or optionally with each other and a
3 functional group from other polymeric complexes or optionally with each other and with
4 the functional groups of other polymeric complexes.

1 7. The composition of claim 6 wherein the polymeric complexes are water-borne or
2 optionally are dispersible in organic solvents.